

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

Ex parte STEVEN R. REZNEK

Appeal No. 2005-0803  
Application No. 09/825,582

ON BRIEF

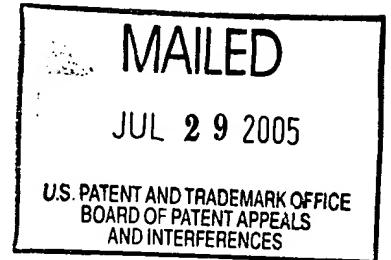
Before OWENS, WALTZ and KRATZ, Administrative Patent Judges.  
KRATZ, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1-3, 7-14 and 17-29. Claims 5, 6, 15, 16 and 30-34, which are all of the other claims pending in this application, stand withdrawn from consideration by the examiner.

BACKGROUND

Appellant's invention relates to a method of making carbon foam, a carbon foam product and a thermal insulating material and a polymer, each including carbon foam. An understanding of the invention can be derived from a reading of exemplary claims 1 and 22, which are reproduced below.



1. A method of making carbon foam comprising pyrolyzing a mixture comprising at least one pyrolyzable material in the presence of at least one oxidizing source and optionally at least one fuel source other than said pyrolyzable material to form said carbon foam, wherein said pyrolyzable material comprises coal, a carbohydrate, sugar, cellulose, or any combination thereof.

22. Carbon foam formed by the method of claim 1.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Kienle, H. Von, "Ullmann's Encyclopedia of Industrial Chemistry," Vol. A.5 (1996), pp 124-132 (Ullmann).  
Lewis, Richard J., "Hawley's Condensed Chemical Dictionary," Twelfth Ed. (1993), pp. 218 and 982.

Claims 1-3, 7-14 and 17-29 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Ullmann.

We refer to the brief and reply brief and to the answer for an exposition of the opposing viewpoints expressed by appellant and the examiner concerning the issues before us on this appeal.

#### OPINION

Having considered each of appellant's arguments set forth in the brief and reply brief and the examiner's positions as set forth in the answer, we reach a decision on the rejection before us as follows.

At the outset, we note that appellant presents five separate claim groupings:

- I. Claims 1, 3, 12 and 21;
- II. Claims 2 and 7-9;
- III. Claims 18-20;
- IV. Claims 22 and 23; and
- V. Claims 24-29.

Appellant states that the claims of each of those separate groupings stand or fall together. Accordingly, we select claims 1, 2, 18, 22 and 27 as the representative claims for each of those respective claim groupings, on which we shall decide this appeal with respect to the examiner's rejection. Moreover, appellant maintains that appealed claims 10, 11, 13, 14 and 17 should be considered as separately patentable. Accordingly, we shall consider the examiner's rejection of claims 10, 11, 13, 14 and 17 separately to the extent that those claims have been separately argued. See 37 CFR § 1.192(c)(7) and (c)(8), as in effect at the time of filing of appellant's brief.

Anticipation by a prior art reference does not require that the reference recognize either the inventive concept of the claimed subject matter or the inherent properties that may be

possessed by the prior art reference. See Verdegaal Bros. Inc. v. Union Oil Co., 814 F.2d 628, 633, 2 USPQ2d 1051, 1054 (Fed. Cir.), cert. denied, 484 U.S. 827 (1987). A prior art reference anticipates the subject matter of a claim when the reference discloses every feature of the claimed invention, either explicitly or inherently (see Hazani v. Int'l Trade Comm'n, 126 F.3d 1473, 1477, 44 USPQ2d 1358, 1361 (Fed. Cir. 1997) and RCA Corp. v. Applied Digital Data Systems, Inc., 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir. 1984)). However, the law of anticipation does not require that the reference teach what the appellant teaches in their specification, but only that the claims on appeal "read on" something disclosed in the reference (see Kalman v. Kimberly-Clark Corp., 713 F.2d 760, 772, 218 USPQ 781, 789 (Fed. Cir. 1983), cert. denied, 465 U.S. 1026 (1984)).

Anticipation under this section is a factual determination. See In re Baxter Travenol Labs., 952 F.2d 388, 390, 21 USPQ2d 1281, 1283 (Fed. Cir. 1991) (citing In re Bond, 910 F.2d 831, 833, 15 USPQ2d 1566, 1567 (Fed. Cir. 1990)). In the case before us, the examiner maintains that Ullmann discloses, expressly or inherently, a method and product meeting every limitation of the invention set forth in the appealed claims.

We note that all of the appealed claims require either a method of producing a "product foam" or a product including a "carbon foam." For example, we note that claim 1 is drawn to a method of pyrolyzing a mixture including pyrolyzable material<sup>1</sup> in the presence of a least one oxidizing source and optionally at least one fuel source to make a so called "carbon foam".

The examiner has taken the position that the active carbon described in Ullmann is a porous material that meets the claimed "carbon foam" and the method of producing active carbon described by Ullmann meets the claimed method whereas appellant disagrees. See, e.g., page 9 of the answer and page 3 of the reply brief. As our initial inquiry into a review of the examiner's rejection, we must analyze the claim language to determine the scope and meaning of each contested limitation. See Gechter v. Davidson, 116 F.3d 1454, 1457, 43 USPQ2d 1030, 1032 (Fed. Cir. 1997). During prosecution of a patent application, the terms in a claim are given their broadest reasonable interpretation consistent with the specification. In re Yamamoto, 740 F.2d 1569, 1571, 222

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<sup>1</sup> As made plain by the "comprising" language of representative claim 1, the pyrolyzable material includes, but is not limited to, coal, a carbohydrate, sugar, cellulose, or any combination thereof.

USPQ 934, 936 (Fed. Cir. 1984). Although no limitations in the specification are normally imputed to the claims being interpreted, see In re Paulsen, 30 F.3d at 1480, 31 USPQ2d at 1674, the specification can still be used to impart the meaning of words in the claims, see In re Barr, 444 F.2d 588, 593, 170 USPQ 330, 335 (CCPA 1971). After all, it is well established that appellant can be his own lexicographer so long as terms are clearly defined and not given meanings repugnant or abhorrent to the ordinary meaning.

Here, we observe that the term "carbon foam," as employed in the appealed claims is one such term, the meaning of which is contested. Appellant has not clearly defined that term in the subject specification. Nor does the record before us reflect that the term "carbon foam" as used in the claims before us represents a term that has a well-recognized and specific meaning to one of ordinary skill in the art.

Concerning this matter, at page 3, lines 10-23 of the subject application, it is provided that (emphasis added):

... in accordance with the purposes of the present invention, as embodied and broadly described herein, the present invention relates to a method of making carbon foam which involves rapid pyrolyzing at least one pyrolyzable material in the presence of a sufficient amount of at least one oxidizing source to

obtain the carbon foam. The pyrolizable material may comprise the fuel source or a separate source may be used.

The present invention further relates to carbon foam made by the above-described method.

The present invention further relates to carbon foam having cells bordered by thin sheets or windows and/or struts. Typically the cells are not closed, but have openings between them. Because the foam can be rigid, pieces of the foam can be broken off, and material can consist of both the foam particles and their fragments.

It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are intended to provide a further explanation of the present invention, as claimed.

In that following detailed description of the invention (specification, page 4, line 2 through page 5, line 5), appellant further informs one of ordinary skill in the art that:

The carbon foam of the present invention is preferably made by pyrolyzing at least one pyrolyzable material in the presence of a sufficient amount of at least one fuel source and at least one oxidizing source. The pyrolyzable material or the products of the pyrolysis may provide the fuel source and/or a separate fuel source may be used. This carbon foam can then be used in its foam state or can be reduced into pieces to form particles which preferably are highly structured.

In more detail, and with reference to the above-described method, the pyrolyzing material or substance is preferably an organic substance such as an organic compound. Examples include, but are not limited to, coal, hydrocarbons, and carbohydrates. Essentially, the substance used is a substance which will pyrolyze instead of evaporate when heated. A preferred pyrolyzable substance is sugar, cellulose compounds,

coal, and the like. Other examples include, but are not limited to, hydrocarbons and polymers and derivatives thereof.

The fuel source that is used in the present invention can be any fuel source, such as a gas, liquid, or solid or combinations thereof. As stated, the pyrolizable material can serve as the fuel source and/or at least one fuel source other than the pyrolizable material can be used. Examples of suitable fuel sources include, but are not limited to, natural gas or hydrocarbon (e.g., oil), or mixtures of two or more materials. An example of such a mixture is a suspension of ground coal in oil.

The oxidizing source can also be in any state, such as a gas, solid, or a liquid, or combinations thereof. Preferably, the oxidizing component is in the form of a gas and is preferably air or oxygen or both.

The amount of each component in the process can be varied depending upon the desired structure of the carbon foam as well as the desired surface area of the carbon foam. For purposes of the present invention, the heat generated during the method should be sufficient to at least partially pyrolyze the pyrolizable material. The oxidizing source should be sufficient to at least partially combust the fuel but the amount of oxidizing source should be controlled such that the pyrolizable material does not completely combust or burn the pyrolizable material. The amount of oxidizing material needed is in the range of 0.05 to 0.75 of the theoretical amount needed to completely burn all of the fuel and combustible material. In the case where a separate fuel is used, the amount of fuel is such that the fuel combustion consumes between 0 and 100% of the oxidizing material.

The preferred rapid pyrolyzing can occur in any device conventionally used for combustion such as a carbon black reactor or other suitable combustion chamber.

After a little more than another page of further non-limiting detailed description of the invention, the specification



refers the reader to a total of 26 patent and patent application documents at the bottom of page 6 and the top of page 7 of the subject specification. Each of those documents is incorporated by reference as part of the subject application. However, appellant has not established that those incorporated documents or any other portion of the specification clearly define the scope of the contested claim term, "carbon foam."<sup>2</sup>

For example, at column 1, lines 60 through 63 in the background portion of U.S. Patent No. 5,945,084<sup>3</sup>, which patent is incorporated by reference in its entirety at the top of page 7 of appellant's specification, the following description is found:

The nomenclature of foams, aerogels, and xerogels is often arbitrary, confusing, and inconsistent. These terms generally pertain porous, lightweight, relatively low density materials.

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<sup>2</sup> U.S. Patent No. 6,500,401, assigned to the same assignee as the present application, suggests that forming a carbon foam via pyrolysis involves using a mixture of a pyrolizable material and an unpyrolizable material as the pyrolysis feedstock and including a subsequent separation of the unpyrolizable material to obtain the carbon foam product. That patent is acknowledged to be of record by the examiner at page 12 of the final rejection dated January 07, 2004.

<sup>3</sup> U.S. Patent No. 5,945,084 is directed to, inter alia, carbon foams and methods of making such foams (copy attached to decision).

In other words, the term "carbon foam" as used in the claims of this application has, at best, when viewed in light of the application specification, an inconsistent or arbitrary meaning to one of ordinary skill in the art. Nor has Appellant furnished a limiting definition for that contested claim term by specifying a particular porosity, density or other property invoked by the use of that term or otherwise offered evidence that serves to furnish a clear limit to the scope of the contested claim term as it would be understood by one of ordinary skill in the art, on this record.<sup>4</sup>

In considering prior art patentability issues, we note that all limitations in a claim must be considered, including limitations which may be characterized as lacking adequate written descriptive support in the originally filed disclosure. Ex parte Grasselli, 231 USPQ 393, 394 (Bd. App. 1983), aff'd

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<sup>4</sup> Dependent claims 24 and 25 specify some structure in that those claims require that the carbon foam product includes "cells bordered by thin sheets, windows, struts, or combinations thereof." However, the specification is silent as to the relative thickness of the sheets and as to how the alternative windows or struts alone or in combination are shaped relative to the cells they border, as called for in those claims. Those claims simply do not offer a clear and unambiguous definition for "carbon foam" as used in those claims. The erroneous recitation of "form" instead of "foam" in claims 24 and 25 is noted.

mem., 738 F.2d 453 (Fed. Cir. 1984). Moreover, the subject matter of a claim does not become obvious because the claim does not serve to particularly point out and distinctly claim what applicant regards as the invention. See In re Wilson, 424 F.2d 1382, 1384, 165 USPQ 494, 496 (CCPA 1970). Indeed, in a given situation, it may be practically impossible to resolve whether or not the claimed subject matter is anticipated by or obvious from prior art disclosures because the scope of the claims are too undeterminable. See In re Steele, 305 F.2d 859, 862, 134 USPQ 292, 295 (CCPA 1962).

In other instances, as here, it is possible to make a reasonable, even if conditional, interpretation of the claims adequate for purposes of resolving prior art issues where the claims nonetheless may run afoul of the requirements of the second paragraph of § 112.<sup>5</sup> In the present case, we find that application of the prior art is possible, if the claim term "carbon foam" is interpreted as broadly as the claims before us are drafted (i.e., covering a carbon product that includes at

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<sup>5</sup> A new ground of rejection of the appealed claims under the second paragraph of 35 U.S.C. § 112 is introduced as part of this decision following our consideration of the examiner's rejection.

least some property or characteristic pertaining to a foam that includes carbon). For example, such a carbon foam may possess a cellular or porous structure, that is a structure that includes cavities or compartments or crevices that can be open or closed such that the pores or cellular construction renders the "carbon foam" material of a lighter weight than a dense non-porous carbon product of the same material composition that does not include such cavities, crevices or compartments. Moreover, such a "carbon foam" product, as claimed herein, is capable of being made by a step or steps including pyrolysis of pyrolyzable material as broadly encompassed within the scope of the claims before us, or covering a fragment or particle of such a foam containing carbon, an interpretation encompassed by and not inconsistent with the application specification before us as it may have been understood by one of ordinary skill in the art.<sup>6</sup>

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<sup>6</sup> See the definitions of "cellular", "foam" and "pyrolysis" at pages 184, 451 and 953 of Merriam-Webster's Collegiate Dictionary (10<sup>th</sup> edition); Merriam-Webster, Inc., Springfield, MA (1996). A copy of the referenced pages is attached to the decision. Also, see, e.g., appealed claim 29, which claim makes it clear that products comprising only fragments pertaining to a carbon foam are encompassed within the scope of the appealed subject matter.

The meaning of the claim terms "pyrolizing" and "pyrolizable" is also contested. The examiner has argued that pyrolysis requires transformation of a substance by heat without oxidation and cites the Condensed Chemical Dictionary in support as set forth at page 9 of the answer. Appellant, on the other hand, seems to assert that the pyrolysis terms in question require incomplete combustion in that an oxidizing source is also required. Here, we agree with the examiner that the term, "oxidizing source" as used in claim 1 is open to including combined oxygen such as steam and carbon dioxide. Appellant does not define either of the pyrolysis terms employed in the claims in the specification and does not limit the term "oxidizing source" to require "air or free oxygen" by way of a providing a limiting definition of the "oxidizing source" claim term in the specification. In our view, the pyrolysis terms employed by appellant are used generically to embrace both the absence of oxygen and the presence of oxygen during that transformation process with the limit that complete combustion is excluded thereby. Thus, we understand the claimed "pyrolizing" to include processes wherein by the action of heat and by the action of any reactants that are present, a substance or part thereof can be

thereof can be thermally and/or chemically converted, including by using combustion so long as the combustion is incomplete. See the definition of pyrolysis provided in the dictionary cited in footnote 6 above.

With that construction of some of the claim terms in mind, we turn to the examiner's anticipation rejection.

Claims 1, 3, 12 and 21

Representative claim 1 of this grouping of claims requires a method for making carbon foam wherein a pyrolizable material including at least one of coal, carbohydrate, sugar or cellulose is subjected to pyrolysis together with oxygen.

Ullmann (page 126, column 2) describes a method for making an activated carbon wherein a material such as coal, wood, etc. is treated with gases containing combined oxygen at temperatures of 800-1000°C to decompose the starting material and form cracks and pores therein. The examiner has reasonably found that decomposition by heat described by Ullmann represents a pyrolysis process, as here claimed, and that the combined oxygen employed meets the claim 1 requirement for the presence of oxygen. Moreover, the examiner has reasonably found that the claimed

carbon foam reads on the active carbon produced by that thermal (pyrolysis) process of Ullmann.

Moreover, we agree with the examiner that appellant's arguments are not persuasive for reasons stated by the examiner at pages 9-12 of the answer. For reasons stated above in our discussion of the claim term "carbon foam", the carbon foam product required by representative claim 1 does not serve to distinguish the method of that claim from the thermal activation method for forming activated carbon described in Ullmann notwithstanding appellant's unsubstantiated and repetitive protestations to the contrary.

Appellant has not offered any persuasive evidence establishing that the product activated carbon of Ullmann is not a porous carbon product that the claim term "carbon foam" reads on. Similarly, Ullmann need not use the term "pyrolysis" for one of ordinary skill in the art to understand that the process described therein wherein starting materials such as coal are decomposed under heating conditions in the presence of combined oxygen, such as steam and carbon dioxide, is a pyrolysis process conducted in the presence of an oxidizing source, as broadly called for by the terms of representative claim 1. As the

examiner pointed out at page 9 of the answer, Ullmann (page 131) expressly teaches that steam and carbon dioxide perform as mild oxidizing agents under the conditions of the activation (pyrolysis) process. We note that representative claim 1 does not require partially combusting fuel, as argued by appellant as a distinction, particularly at pages 4-8 of the reply brief. See In re Self, 671 F.2d 1344, 1350-1351, 213 USPQ 1, 7 (CCPA 1982) (when the claim does not recite allegedly distinguishable features, "appellant[s] cannot rely on them to establish patentability.").

Further concerning this matter, we again note that in determining the patentability of claims, the PTO gives claim language its "broadest reasonable interpretation" consistent with the specification as it would be understood by one of ordinary skill in the art. In re Morris, 127 F.3d 1048, 1054, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997) (citations omitted). Even after a patent issues, a claim term takes on its ordinary and accustomed meaning unless the patentee demonstrates an intent to deviate from that meaning by redefining the term in the intrinsic record using words of "manifest exclusion or restriction." Teleflex Inc. v. Ficosa North America Corp., 299 F.3d 1313, 1325, 63



USPQ2d 1374, 1380 (Fed. Cir. 2002). Here, appellant provides no special definitions requiring that the claimed pyrolyzing step must include partial combustion as argued. Indeed, as reproduced above in this decision, at page 3, lines 20-22 of appellant's specification, it is made manifest that appellant provided the general and detailed description of the invention as being "exemplary and explanatory only." Appellant simply has not provided a source of special definitions for each claim term in their specification that must be imputed into the claims as limitations as appellant seemingly argues.

On this record, we shall affirm the examiner's 102(b) rejection of representative claim 1 and the claims that are grouped together therewith for reasons discussed above and in the final rejection and answer furnished by the examiner.

Claims 2 and 7-9

In addition to the features of claim 1, representative claim 2 additionally requires that the pyrolysis method includes the presence of at least one fuel source in addition to the pyrolyzable material used in the method. At page 131, column 2, Ullmann teaches that gaseous fuels produced during the gas activation are present during that gas activation.

The examiner refers to Table 21 at page 127 of Ullmann and asserts that the oxygen content of various materials that may be activated (pyrolyzed) in Ullmann as depicted in that figure represents a disclosure of the claimed oxidizing material requirements of claim 11. Appellant urges that claim 11 requires oxidizing material that is separate from the pyrolizable material. However, as correctly noted by the examiner, claim 11 makes no such requirement. In this regard, we note that claim 1 requires a pyrolizable material and an oxygen source whereas claim 11, which depends from claim 1, requires that "said oxidizing material" is present in a certain amount without specifying whether the oxidizing material being referred to is solely in the oxidizing source of claim 1 or partially or wholly part of the pyrolyzable material of claim 1. Appellant does not argue that the amount of oxygen disclosed in Table 21 of Ullmann would not meet the amount specified in claim 11 if claim 11 is interpreted as being open to including the oxygen content of the pyrolyzable material in the amount of oxygen required by claim 11, as we interpret that claim. On this record, we will affirm the examiner's rejection of claim 11.

Claims 13, 14 and 17

Concerning claim 13, we agree with appellant that the examiner has not made out a prima facie case of anticipation of that claim by explaining where Ullmann reasonably describes adding a fuel source, oxidizing source and a pyrolyzable material as a mixture. In this regard, the examiner's comments at pages 5, 6 and 14 of the answer in referring to page 125 of Ullmann and the description of the activated carbon properties thereat falls short in establishing how that disclosure describes the subject matter of the claim 13 method. Similarly, regarding claim 14, the examiner has not fairly explained how the disclosure at page 131 of Ullmann represents a description of a step of introducing pyrolyzable material into a combustion chamber while dispersed in a fuel source or an oxidizing source or both.

Furthermore, regarding claim 17, the examiner has not reasonably established that Ullmann necessarily describes the operation of the rotary kiln depicted in Figure 23 as involving the order of steps as required by claim 17.

Consequently, on this record, we reverse the examiner's anticipation rejection of claims 13, 14 and 17.

Claims 18-20

All of claims 18-20 require that the pyrolyzable material is introduced by being dispersed in a carrier gas. The examiner simply has not established how the disclosure at pages 126 and 127 of Ullmann describes such a dispersion introduction step. Consequently, we reverse the examiner's anticipation rejection of claims 18-20.<sup>7</sup>

Claims 22 and 23

Representative claim 22 is drawn to a carbon foam product produced by the method of claim 1. We determine that the examiner has presented a prima facie case of anticipation of the product of representative claim 22 for reasons set forth above with regard to our consideration and affirmance of the examiner's rejection of representative method claim 1.

Moreover, representative claim 22 describes the product carbon foam by the process by which it is made. Since appellant's claims are in product-by-process format, the

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<sup>7</sup> In the event of any further prosecution of this subject matter before the examiner and prior to final disposition of this application, the examiner should determine whether or not the subject matter of any of claims 13, 14 and 17-20 would have been rendered obvious within the meaning of § 103 by Ullmann alone or in combination with other prior art.

patentability of those claims is determined based on the product itself, not on the method of making it. See In re Thorpe, 777 F.2d 695, 697, 227 USPQ 964, 966 (Fed. Cir. 1985) ("If the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process."). Whether a rejection is under 35 U.S.C. § 102 or § 103, and when the appellant's product and that of the prior art appear to be identical or substantially identical, the burden shifts to the appellant to provide evidence that the prior art product does not necessarily or inherently possess the relied-upon characteristics of the appellant's claimed product. See In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980); In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977); In re Fessmann, 489 F.2d 742, 745, 180 USPQ 324, 326 (CCPA 1974). The reason is that the Patent and Trademark Office is not able to manufacture and compare products. See Best, 562 F.2d at 1255, 195 USPQ at 434; In re Brown, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972).

Here, the examiner has reasonably determined that the porous active carbon of Ullmann is prepared by a method corresponding to appellant's method (see reference to claim 1 method in product-

by-process claim 22), for reasons discussed above and in the answer. Moreover, the product active carbon of Ullmann is described as possessing a structure that includes pores, a product characteristic that would be expected to be consistent with a carbon foam that is encompassed by that is, can be made by, the broad (pyrolysis) method, as here claimed.

While appellant argues that the process of the claimed invention is significantly different, we do not find that argument persuasive for reasons discussed above and in the answer. Because we find that the claimed and prior art products appear to be substantially identical and are made by processes that can to be substantially identical given the breadth of the claims before us, we determine that the examiner has set forth a reasonable basis for asserting that the product active carbon of Ullmann would be substantially identical to that called for in representative claim 22. Appellant has not substantiated their argument to the contrary with any persuasive evidence. It follows that we will sustain the examiner's § 102(b) rejection of claims 22 and 23 as being anticipated by Ullmann, on this record.

Claims 24-29

Representative claim 27 is also a product-by-process claim that differs from claim 22, as discussed above, in that claim 27 further requires that the product possesses the property of being rigid. However, representative claim 27 does not require any particular degree of rigidity. Moreover, appellant has not fairly explained how the recitation of that functional property of the claimed product serves to further distinguish the product of claim 27 over the active carbon foam of Ullmann. In this regard, it is reasonable to expect the same or similar rigidity property for the active carbon of Ullmann as that for the claimed product given the substantial similarities in their preparation methods, as discussed above with respect to claims 1 and 22. Moreover, Ullmann discloses that active carbon granules can be made to be crush resistant, a property which reasonably implies a degree of rigidity. See page 126, first paragraph of Ullmann. Consequently, we shall also sustain the examiner's 102(b) rejection of representative claim 27 and the other claims (24, 25, 26, 28 and 29) of this grouping of claims that stand or fall therewith for the reasons discussed above and with respect to our affirmance of the examiner's rejection of claim 22.

New Ground of Rejection

Pursuant to 37 CFR § 41.50(b), we enter the following new rejection.

Claims 1-3, 7-14 and 17-29 are rejected under 35 U.S.C. § 112, second paragraph, for failing to particularly point out and distinctly claim the subject matter which appellant regards as the invention.

As discussed above, appellant is of the view that their claimed invention involves a carbon foam that represents a carbon product that, by definition, is distinct from other carbon products, such as an active carbon as described by Ullmann. However, for reasons discussed above, we do not find that appellant's claims are limited to a specially defined carbon foam that is uniquely different from prior art active carbons that are prepared by thermal (pyrolysis) steps employing conditions similar to those claimed. In particular, the background portion of U.S. Patent No. 5,945,084, as discussed above, suggests that the claim term could have several different meanings to those of ordinary skill in the art. As evidenced by the arguments presented by appellant in this appeal, it is our view that appellant is not particularly and distinctly claiming what they



regard as invention absent the presence of a limiting definition for the term "carbon foam" in the present application that would clearly exclude prior art active carbons as well as myriad other prior art carbon products that applicant obviously intended to exclude from the scope of the claimed subject matter by the use of that term.<sup>8</sup> Moreover, as noted above in our discussion of the prior art rejection of claim 11, "said oxidizing material," as recited in that claim, has no clear antecedent support in claim 1 that is clearly and unambiguously identified by using that phrase. Consequently, for the reasons set forth above in our claim construction, which we hereby reference, and as further set forth in this new ground of rejection, we determine that claims 1-3, 7-14 and 17-29 are not in accord with all of the requirements of 35 U.S.C. § 112, second paragraph.

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<sup>8</sup> In this regard, we note that a claim may run afoul of the provisions of § 112, second paragraph in two separate ways. In one way, the claim can be of indeterminate scope and fail to serve the notice function by not particularly and distinctly setting forth the boundaries of the subject matter that the claim seeks to protect. The second purpose of the requirements of the second paragraph of § 112 is to ensure that an applicant claims that which the applicant regards as invention and the second way that a claim can violate that subsection of the statute is that the claims presented do not serve to define what applicant regards as his invention.

OTHER ISSUES

As set forth above, we have determined that the product-by-process claims, particularly claim 22, presented in this appeal are broadly drawn in that the process by which they are made encompasses products containing some carbon as well as including some structural aspect that relates to a foam, such as a porous or relatively light weight structure, as well as a particle or other piece of such a carbon foam obtained by grinding or other treatment of such a carbon foam product so long as the product could reasonably be expected to be produced by a process that includes application of at least some conversion of a material by pyrolysis, as broadly described above.

As such, prior to final disposition of this application and/or in the event of further prosecution before the examiner as a result of the new ground of rejection entered above, the examiner should determine whether or not the claims of this application (particularly the product claims) encompass products or processes disclosed or suggested in other prior art references of record, including prior art referred to in the application specification that disclose carbon foam type materials. In this regard, we note that the examiner has made particular reference

to several prior art patents that disclose carbon foams at page 12 of the final office action dated January 07, 2004.

The examiner should also determine whether or not other prior art pyrolysis or incomplete combustion processes produce carbon-containing products that the product-by-process claims and/or process claims may read on or be suggested by. The examiner should give particular attention to method claims 13, 14, and 17-20 in any such further consideration and determine whether or not the subject matter thereof may be subject to a § 103 rejection over any art of record or otherwise known by the examiner.

The examiner should also consider whether or not any of the claims of this application may be subjected to an obviousness-type double patenting rejection over any of the claims of commonly assigned U.S. Patent No. 6,500,401, particularly the product-by-process claims.

Moreover, we note that the examiner correctly concluded that U.S. Patent No. 6,500,401 did not represent prior art under § 102(b) to the claims of the present application at page of the final rejection. However, U.S. Patent No. 6,500,401 to Reznick et al. is available, prima facie, as prior art under § 102(e)

because the record reflects that the present application was filed on April 03, 2001 whereas the Reznick et al. patent referred to above issued from an application filed on March 13, 2001. Thus, the examiner should determine whether or not any of the claims of this application, particularly the product-by-process claims, are subject to a rejection under § 102(e) over U.S. Patent No. 6,500,401 and or whether any of the claims of this application are subject to a rejection under § 103(a)/§ 102(e) over U.S. Patent No. 6,500,401 alone or in combination with other prior art. With regard to the § 103(a) option, we note that appellant may be able to establish that the subject matter of this application and that prior patent were owned by the same person (entity) or subject to common assignment at the time the invention was made so as to obviate the availability of U.S. Patent No. 6,500,401 as prior art under § 103(a). See § 103(c).

#### CONCLUSION

The decision of the examiner to reject claims 1-3, 7-12 and 21-29 under 35 U.S.C. § 102(b) as being anticipated by Ullmann is affirmed. The decision of the examiner to reject claims 13, 14 and 17-20 under 35 U.S.C. § 102(b) as being anticipated by

Ullmann is reversed. A new rejection of claims 1-3, 7-14 and 17-29 has been made.

Regarding the affirmed rejection, 37 CFR § 41.52(a)(1) provides "[a]ppellants may file a single request for rehearing within two months from the date of the original decision of the Board."

In addition to affirming the examiner's rejection of one or more claims, this opinion contains a new ground of rejection pursuant to 37 CFR § 41.50(b) (effective September 13, 2004, 69 Fed. Reg. 49960 (August 12, 2004), 1286 Off. Gaz. Pat. Office 21 (September 7, 2004)). 37 CFR § 41.50(b) provides "[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review."

37 CFR § 41.50(b) also provides that appellants, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

(1) Reopen prosecution. Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the

examiner, in which event the proceeding will be remanded to the examiner . . . .

(2) Request rehearing. Request that the proceeding be reheard under § 41.52 by the Board upon the same record . . . .

Should appellants elect to prosecute further before the examiner pursuant to 37 CFR § 41.50(b)(1), in order to preserve the right to seek review under 35 U.S.C. §§ 141 or 145 with respect to the affirmed rejection, the effective date of the affirmance is deferred until conclusion of the prosecution before the examiner unless, as a mere incident to the limited prosecution, the affirmed rejection is overcome.

If appellants elect prosecution before the examiner and this does not result in allowance of the application, abandonment or a second appeal, this case should be returned to the Board of Patent Appeals and Interferences for final action on the affirmed rejection, including any timely request for rehearing thereof.

AFFIRMED-IN-PART; 37 CFR § 41.50 (b)

  
PETER F. KRATZ  
Administrative Patent Judge

PFK/sld

Appeal No. 2005-0803  
Application No. 09/825,582

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WILLIAM F. DEE, ESQ.  
CABOT CORPORATION  
LAW DEPARTMENT  
157 CONCORD ROAD  
BILLERICA, MA 01821



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of *selera*, modif. of LL *selino*, fr. Gk] (1664) : a European herb (*Apium graveolens*) of the carrot family; specif : one of a cultivated variety (*A. graveolens dulce*) with leafstalks eaten raw or cooked

**celery cabbage** *n* (1930) : CHINESE CABBAGE *b*

**celes-ta** \sə-'les-tə, chə-\ or **ce-les-te** \sə-'lest, chə-\ *n* [F *céléste*, alter. of *céleste*, lit., heavenly, fr. L *caelestis*] (1899) : a keyboard instrument with hammers that strike steel plates producing a tone similar to that of a glockenspiel

**celes-tial** \sə-'les-ti-əl, 'lesh-, 'les-tē-\ *adj* [ME, fr. MF, fr. L *caelestis* celestial, fr. *caelum* sky] (14c) 1 : of, relating to, or suggesting heaven or divinity 2 : of or relating to the sky or visible heavens (the sun, moon, and stars are ~ bodies) 3 a : ETHEREAL, OTHERWORLDLY *b* : OLYMPIAN, SUPREME 4 *cap* [Celestial Empire, old name for China] : of or relating to China or the Chinese — **celes-tial-ly** \-chə-'lē-, -tē-\ *adv*

**celestial** *n* (1573) 1 : a heavenly or mythical being 2 *cap* : CHINESE

**celestial equator** *n* (1875) : the great circle on the celestial sphere midway between the celestial poles

**celestial globe** *n* (ca. 1771) : a globe depicting the celestial bodies

**celestial hierarchy** *n* (1883) : a traditional hierarchy of angels ranked from lowest to highest into the following nine orders: angels, archangels, principalities, powers, virtues, dominions, thrones, cherubim, and seraphim

**celestial marriage** *n* (1919) : a special order of Mormon marriage solemnized in a Mormon temple and held to be binding for a future life as well as the present one

**celestial navigation** *n* (1939) : navigation by observation of the positions of celestial bodies

**celestial pole** *n* (1868) : either of the two points on the celestial sphere around which the diurnal rotation of the stars appears to take place

**celestial sphere** *n* (1879) : an imaginary sphere of infinite radius against which the celestial bodies appear to be projected and of which the apparent dome of the visible sky forms half

**celes-tite** \sə-'les-tīt, sə-'les-,tīt\ *n* [G *Zölestin*, fr. L *caelestis*] (1854) : a usu. white mineral consisting of the sulfate of strontium

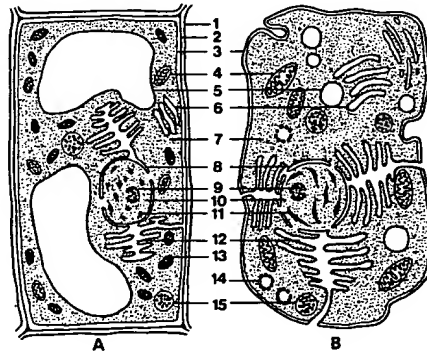
**cel-li-ac** \sə-'lē-,ak\ *adj* [L *coeliacus*, fr. Gk *kōiliakos*, fr. *kōilia* cavity, fr. *kōilos* hollow — more at CAVE] (1662) : of or relating to the abdominal cavity

**celiac disease** *n* (1911) : a chronic nutritional disorder esp. in young children that is characterized by defective digestion and utilization of fats and often by abdominal distention, diarrhea, and fatty stools

**cel-i-ba-cy** \sə-'lə-bə-sē\ *n* (1663) 1 : the state of not being married 2 a : abstinence from sexual intercourse *b* : abstinence by vow from marriage

**cel-i-bate** \sə-'lə-bət\ *n* [L *caelibatus*, fr. *caelib-*] *caelebs* unmarried] (ca. 1847) : a person who lives in celibacy — **celibate** *adj*

**cell** \sɛl\ *n* [ME, fr. OE, religious house and OF *celle* hermit's cell, fr. L *cella* small room; akin to L *celare* to conceal — more at HELL] (12c) 1 : a small religious house dependent on a monastery or convent 2 a : a one-room dwelling occupied by a solitary person (as a hermit) *b* : a single room (as in a convent or prison) usu. for one person 3 : a small compartment, cavity, or bounded space: as a : one of the compartments of a honeycomb *b* : a membranous area bounded by veins in the wing of an insect 4 : a small usu. microscopic mass of protoplasm bounded externally by a semipermeable membrane, usu. including one or more nuclei and various other organelles with their products, capable alone or interacting with other cells of performing all the fundamental functions of life, and forming the smallest structural unit of living matter capable of functioning independently 5 a (1) : a receptacle (as a cup or jar) containing electrodes and an electrolyte either for generating electricity by chemical action or for use in electrolysis (2) : FUEL CELL *b* : a single unit in a device for converting radiant energy into electrical energy or for varying the intensity of an electrical current in accordance with radiation 6 : a unit in a statistical array (as a spreadsheet) formed by the intersection of a column and a row 7 : the basic and usu. smallest unit of an organization or movement (a communist ~) 8 : a portion of the atmosphere that behaves as a unit 9 : any of the small sections of a geographic area of a cellular telephone system



cell 4 (schematic): A plant, B animal; 1 cell wall, 2 middle lamella, 3 plasma membrane, 4 mitochondrion, 5 vacuole, 6 Golgi apparatus, 7 cytoplasm, 8 nuclear membrane, 9 nucleolus, 10 nucleus, 11 chromatin, 12 endoplasmic reticulum with associated ribosomes, 13 chloroplast, 14 centriole, 15 lysosome

**cel-lar** \sɛ-'lɑ-\ *n* [ME *celer*, fr. AF, fr. L *cellarium* storeroom, fr. *cella*] (13c) 1 a : BASEMENT; also : a covered excavation *b* : the lowest grade or rank; esp : the lowest place in the standings (as of an athletic league) 2 : a stock of wines

**cel-lar** *w* (1677) : to put into a cellar (as for storage)

**cel-lar-age** \sɛ-'lɑ-rɪj\ *n* (1602) : cellar space esp. for storage

**cel-lar-er** \sɛ-'lɑ-r-ər\ *n* [ME *celer*, fr. OF, fr. LL *cellarius*, fr. L *cellarium*] (13c) : an official (as in a monastery) in charge of provisions

**cel-lar-ette** or **cel-lar-et** \sɛ-'lɑ-'ret\ *n* (ca. 1807) : a case or sideboard for holding bottles of wine or liquor

**cell body** *n* (1878) : the nucleus-containing central part of a neuron exclusive of its axons and dendrites — see NEURON illustration

**cell cycle** *n* (1961) : the complete series of events from one cell division to the next — compare G<sub>1</sub> PHASE, G<sub>2</sub> PHASE, M PHASE, S PHASE

**cell division** *n* (1882) : the process by which cells multiply involving both nuclear and cytoplasmic division — compare MEIOSIS, MITOSIS

**celled** \sɛld\ *adj* : having (such or so many) cells — used in combination (single-celled organisms)

**cell-me-di-at-ed** \sɛl-'mē-dē-ā-təd\ *adj* (1967) : relating to or being the part of immunity or the immune response that is mediated primarily by T cells

**cell membrane** *n* (1870) : PLASMA MEMBRANE

**cel-lo** \tʃe-'lɔ-\ *n*, *pl* *cello* also **cel-li** \-lē\ [short for *violoncello*] (ca. 1876) : the bass member of the violin family tuned an octave below the viola — **cel-list** \tʃe-'list\ *n*

**cel-lo-bi-ose** \sɛ-'lə-'bi-, -dōz\ *n* [ISV *cellulose* + -o- + *biose* disaccharide, fr. *bi-* + -ose] (1902) : a faintly sweet disaccharide C<sub>12</sub>H<sub>22</sub>O<sub>11</sub> obtained by partial hydrolysis of cellulose

**cel-loi-din** \sɛ-'ləi-'dɪn\ *n* [cellulose + -oid + -in] (1883) : a purified pyroxylin used chiefly in microscopy

**cel-lo-phane** \sɛ-'lə-'fæn\ *n* [F, fr. *cellulose* + -phane (as in *diaphane* diaphanous, fr. ML *diaphanus*)] (1912) : regenerated cellulose in thin transparent sheets used esp. for packaging

**cell plate** *n* (1882) : a disk formed in the phragmoplast of a dividing plant cell that eventually forms the middle lamella of the wall between the daughter cells

**cell sap** *n* (ca. 1889) 1 : the liquid contents of a plant cell vacuole 2 : CYTOSOL

**cell theory** *n* (ca. 1890) : a theory in biology that includes one or both of the statements that the cell is the fundamental structural and functional unit of living matter and that the organism is composed of autonomous cells with its properties being the sum of those of its cells

**cel-lu-lar** \sɛl-'yɑ-lər\ *adj* [NL *cellularis*, fr. *cellula* living cell, fr. L, dim. of *cella* small room] (ca. 1739) 1 : of, relating to, or consisting of cells 2 : containing cavities : having a porous texture (~ rocks) 3 : of, relating to, or being a radiotelephone system in which a geographical area (as a city) is divided into small sections each served by a transmitter of limited range so that any available radio channel can be used in different parts of the area simultaneously — **cel-lu-lar-i-ty** \sɛl-'yɑ-lər-i-tē\ *n*

**cel-lu-lase** \sɛl-'yɑ-lās, -lāz\ *n* [ISV] (1903) : an enzyme that hydrolyzes cellulose

**cel-lule** \sɛl-'jyū(-ə)\ *n* [L *cellula*] (ca. 1693) : a small cell

**cel-lu-lite** \sɛl-'yɑ-līt, -lēt\ *n* [F, lit., accumulation of subcutaneous fat, cellulitis, fr. *cellule* cell + -ite -itis] (1968) : lumpy fat found in the thighs, hips, and buttocks of some women

**cel-lu-li-tis** \sɛl-'yɑ-'li-təs\ *n* [NL, fr. *cellula*] (1861) : diffuse and esp. subcutaneous inflammation of connective tissue

**cel-lu-loid** \sɛl-'yɑ-lōid\ *n* [fr. *Celluloid*, a trademark] (1871) 1 : a tough flammable thermoplastic composed essentially of cellulose nitrate and camphor 2 : a motion-picture film (a work ... making its third appearance on ~ — John McCarten) — **celluloid** *adj*

**cel-lu-lo-lyt-ic** \sɛl-'yɑ-lō-'li-tik\ *adj* [cellulose + -o- + -lytic] (1943) : hydrolyzing or having the capacity to hydrolyze cellulose

**cel-lu-lose** \sɛl-'yɑ-lōs, -lōz\ *n* [F, fr. *cellule* living cell, fr. NL *cellula*] (1848) : a polysaccharide (C<sub>6</sub>H<sub>10</sub>O<sub>5</sub>)<sub>x</sub> of glucose units that constitutes the chief part of the cell walls of plants, occurs naturally in such fibrous products as cotton and kapok, and is the raw material of many manufactured goods (as paper, rayon, and cellophane)

**cellulose acetate** *n* (1895) : any of several compounds insoluble in water that are formed esp. by the action of acetic acid, anhydride of acetic acid, and sulfuric acid on cellulose and are used for making textile fibers, packaging sheets, photographic films, and varnishes

**cellulose nitrate** *n* (1880) : NITROCELLULOSE

**cel-lu-los-ic** \sɛl-'yɑ-'lə-sik, -zik\ *adj* (1881) : of, relating to, or made from cellulose — **cellulosic** *n*

**cell wall** *n* (ca. 1849) : the usu. rigid nonliving permeable wall that surrounds the plasma membrane and encloses and supports the cells of most plants, bacteria, fungi, and algae — see CELL illustration

**Cel-si-us** \sɛl-'sē-əs, -shəs\ *adj* [Anders Celsius] (ca. 1850) : relating to, conforming to, or having the international thermometric scale on which the interval between the triple point of water and the boiling point of water is divided into 99.99 degrees with 0.01° representing the triple point and 100° the boiling point (10° ~) — abbr. C; compare CENTIGRADE

**celt** \sɛlt\ *n* [LL *celtis* chisel] (1715) : a prehistoric stone or metal implement shaped like a chisel or ax head

**Celt** \kelt, 'sɛlt\ *n* [L *Celtae*, pl., fr. Gk *Keltor*] (1550) 1 : a member of a division of the early Indo-European peoples distributed from the British Isles and Spain to Asia Minor 2 : a modern Gael, Highland Scot, Irishman, Welshman, Cornishman, or Breton

**Celt-ic** \kelt-'ik, 'sɛl-\ *adj* (1590) : of, relating to, or characteristic of the Celts or their languages

**Celtic** *n* (1739) : a group of Indo-European languages usu. subdivided into Brythonic and Goidelic and now largely confined to Brittany, Wales, western Ireland, and the Scottish Highlands — see INDO-EUROPEAN LANGUAGES table

**Celtic cross** *n* (1873) : a cross having essentially the form of a Latin cross with a ring about the intersection of the crossbar and upright shaft — see CROSS illustration

**Celt-i-cist** \kelt-'tə-sist, 'sɛl-\ *n* (1912) : a specialist in Celtic languages or cultures

**cem-ba-lo** \tʃem-'bɑ-lō\ *n*, *pl* **-ba-li** \-'lə\ or **-balos** [It] (ca. 1801) : HARPSICORD

**ce-ment** \si-'ment also 'sɛ-'ment\ *n* [ME *sement*, fr. MF *ciment*, fr. L *caementum* stone chips used in making mortar, fr. *caedere* to cut] (14c) 1 a : a powder of alumina, silica, lime, iron oxide, and magnesium oxide burned together in a kiln and finely pulverized and used as an





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